

REMARKS

Favorable reconsideration of applicants' pending claims is respectfully requested in view of the above amendments and following remarks. This Amendment and Reply is being filed within five months following the March 1, 2005 mailing date of the Office Action. Applicants' petition for an extension of time of two months to reply to the outstanding action and the requisite fee accompany this response. This response is therefore timely filed.

Claims 1-20 were pending and considered by the Examiner in the outstanding Office action. Claims 1, 6, 12 and 13 have been amended; claims 7-9 have been cancelled; and claims 21-23 have been added. Claims 1-6 and 10-23 are pending as a consequence of the amendments presented herein.

The specification has been amended to update the status of a parent application, indicating that U.S. Patent Application 09/995,897, filed November 28, 2001, issued as U.S. Patent 6,875,176 on April 4, 2005. The specification has also been amended to correct a minor typographical error at the top of page 12.

Claim 1 has been amended to specify a method for detecting a physiological property of target myocardial tissue, comprising: *monitoring the cardiac cycle*; non-invasively inducing a tissue displacement at a target myocardial tissue site *at a determined time during the cardiac cycle* by applying an ultrasound pulse; non-invasively acquiring data relating to an acoustic property of the target myocardial tissue site *that is directly related to at least one of myocardial tissue stiffness, myocardial tissue strain and strain rate and myocardial tissue tension at or in proximity to the target myocardial tissue site* prior to and/or during and/or following the induction of tissue displacement; and relating the acquired data with a physiological property of the myocardial target tissue or a cardiac parameter. These aspects of applicants' claimed invention are described throughout the application as filed, with particular reference to page 11, lines 17-28, page 12, lines 27-37, and page 14, lines 19-29.

Claim 6 has been amended to insert words that were inadvertently omitted in the claims filed with the application. Claim 12 has been amended to specify inducing oscillation of the target myocardial tissue *at the target myocardial tissue site at a determined time during the*

cardiac cycle. Claim 13 has been amended to additionally specify *monitoring the cardiac cycle*. Support for these amendments is found throughout the application as filed.

Claims 21-23 have been added. Newly added claim 21 specifies a method of claim 1 wherein the target myocardial tissue site comprises myocardial ventricular tissue. This aspect of applicants' claimed invention is described throughout the specification, as filed, with particular reference to page 12, lines 13-26. Newly added claim 22 specifies inducing tissue displacements at the target myocardial tissue site, monitoring at least one of myocardial contractility, myocardial strain and strain rate and/or myocardial tension over a period of at least several cardiac cycles and observing changes in the properties of the target myocardial tissue site over time. This aspect of applicants' claimed invention is described in applicants' specification, as filed, for example at page 11, lines 34-37. Newly added claim 23 specifies a method of claim 1 comprising non-invasively acquiring data relating to an acoustic property of the target myocardial tissue site during diastole. This aspect of applicants' claimed invention is described throughout the specification, as filed, with particular reference to page 20, lines 7-19.

It is urged that there is a clear basis in the application, as filed, for the claim amendments and new claims presented.

Specification

The disclosure was objected to because it requires updated information relating to related applications. The specification has been amended to note that parent U.S. Patent Application No. 09/995,897, filed Nov. 28, 2001 issued as U.S. Patent 6,875,176 on April 4, 2005. It is urged that this amendment overcomes the Examiner's objection to the disclosure.

Claim Rejections – 35 U.S.C. §103(a)

Claims 1-20 were rejected under 35 U.S.C. 103(a) as being obvious over Sarvazyan et al., U.S. Patent 5,810,731. This rejection is respectfully traversed, particularly in view of the above amendments and following remarks.

Sarvazyan et al. disclose a method and apparatus for elasticity imaging using remotely induced shear waves, based on the observation that changes of shear elasticity modulus of tissues are significant and can be used as a diagnostic tool to detect tissue abnormalities. Shear strain is

induced in tissue noninvasively by applying the radiation force of a focused acoustic source, such as a focused ultrasound transducer. The remotely induced waves are detected and tissue viscoelastic properties are evaluated based on the measured propagation speed and attenuation of the shear waves.

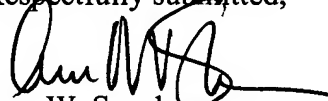
Claim 1, as amended, specifies a method for detecting a physiological property of target myocardial tissue comprising monitoring the cardiac cycle, non-invasively inducing a tissue displacement at a target myocardial tissue site at a specified time during the cardiac cycle by applying an ultrasound pulse, non-invasively acquiring data relating to an acoustic property of the target myocardial tissue site that is directly related to at least one of myocardial contractility, myocardial strain and strain rate at or in proximity to the target myocardial tissue site prior to and/or during and/or following the induction of tissue displacement, and relating the acquired data with a physiological property of the myocardial target tissue or a cardiac parameter. Applicants do not perceive that Sarvazyan et al. discloses or suggests this combination of features, and it is submitted that applicants' claims 1-6, 10-12, and 21-23 are *not* rendered obvious by the teachings of Sarvazyan et al. in the manner required by 35 U.S.C. 103(a).

Applicants' claims 13-20, as amended, specify methods for assessing a physiological property of a target myocardial tissue comprising monitoring the cardiac cycle, acquiring acoustic data relating to *intrinsic tissue displacements* at a target myocardial tissue site at multiple time points over the course of at least one cardiac cycle, and relating the acoustic data with a physiological property of the target myocardial tissue, wherein said acoustic data is collected by using an ultrasound transducer. Applicants do not perceive that Sarvazyan et al. disclose or suggest the detection or use of *intrinsic tissue displacements*. Rather, Sarvazyan et al. induce a shear wave in tissue using a focused acoustic pulse and evaluate the properties of the induced shear acoustic waves. It is therefore submitted that applicants' claims 13-20 are *not* rendered obvious by the teachings of Sarvazyan et al. in the manner required by 35 U.S.C. 103(a).

Conclusion

In view of the above amendments and remarks, applicants believe that pending claims 1-6 and 10-23 are now in condition for allowance. Early consideration and allowance of all the pending claims are respectfully requested.

Respectfully submitted,



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